Reference Manual

IQ Express™ Docking Station

for

ToxiPro®, ToxiLtd® & Toxi3Ltd™

Sperian Instrumentation
651 South Main Street
Middletown, CT 06457
(800) 711-6776 (860) 344-1079
Fax (860) 344-1068
Part number 13-275
Version 4.03
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⚠WARNING

THE IQ EXPRESS™ IS DESIGNED TO INTERFACE WITH SPERIAN INSTRUMENTATION GAS DETECTORS.

SPERIAN INSTRUMENTATION GAS DETECTORS HAVE BEEN DESIGNED FOR THE DETECTION OF DEFICIENCIES OF OXYGEN, ACCUMULATIONS OF FLAMMABLE GASES AND VAPORS AND ACCUMULATIONS OF TOXIC VAPORS.

IN ORDER TO ENSURE THAT THE USER IS PROPERLY WARNED OF POTENTIALLY DANGEROUS ATMOSPHERIC CONDITIONS, IT IS ESSENTIAL THAT THE INSTRUCTIONS IN THIS MANUAL AND THE OPERATIONS AND/OR REFERENCE MANUAL(S) FOR THE GAS DETECTOR(S) BE READ, FULLY UNDERSTOOD, AND FOLLOWED.

THIS MANUAL IS NOT INTENDED TO REPLACE THE OPERATIONS AND/OR REFERENCE MANUALS FOR THE GAS DETECTOR. THIS MANUAL IS ONLY DESIGNED TO AID IN THE INSTALLATION AND OPERATION OF THE IQ EXPRESS SYSTEM AND SHOULD BE USED IN CONJUNCTION WITH THE INSTRUMENT REFERENCE OR OPERATIONS MANUAL AT ALL TIMES.

IQ Express Reference Manual
Sperian Instrumentation Part Number 13-275
Version 4.02
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by
Sperian Instrumentation, LLC
Middletown, Connecticut 06457

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Warnings and Cautions

A. Signal Words

The following signal words, as defined by ANSI Z535.4-1998, are used in the IQ Express Reference Manual.

⚠DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION indicates a potentially hazardous situation, which if not avoided, may result in moderate or minor injury.

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

1. Overview

The IQ Express is an automatic calibration station for use with the ToxiPro, OxyPro, ToxiLtd and OxyLtd Gas Detectors. The IQ Express automatically performs up to eight critical tests including sensor identification, instrument performance, bump and alarm tests and necessary record-keeping procedures. The station retains a historical record of instrument testing in the system's onboard memory.

The IQ Express Dock is available in two versions. The standard version is able to process instruments containing O_2, CO and H_2S sensors. The enhanced version adds the ability to process ToxiPro instruments for SO_2, Cl_2, NO_2, NH_3, HCN and PH_3. Either type of dock may be operated as a stand-alone calibration station, or may be connected to a PC via USB or Ethernet for increased control over system operations.

When the IQ Express is operated without a PC interface, it will operate with the last set of calibration gas settings that were uploaded into the instrument and will automatically store data until its memory is full.

Unless specified at the time of purchase, all IQ Express Docks are shipped from Sperian Instrumentation configured for CO/H_2S instruments with standard calibration gas settings. In the event that the dock is to be used as a stand-alone calibration station for an instrument with a gas other than CO or H_2S, or requires a non-standard calibration gas setting, the dock must be reprogrammed with the IQ Express PC Software.

The IQ Express PC Software must be loaded onto the PC prior to completing the physical connection to the PC. When connected to the PC, the IQ Express will automatically upload all instrument data into the PC whenever the instrument is placed in the dock.

Note: Do not connect the IQ Express to the PC until the software has been installed and the PC has been restarted.

1.1 Tests and record keeping

The IQ Express Station automatically performs the following eight procedures whenever an instrument is placed in the dock.

- Instrument identification
- Battery test
- Audible alarm test
- Visual alarm test
- Vibrating alarm test (if applicable)
- Fresh air calibration
- Bump test
- Record-keeping
- Datalogger and Eventlogger download (IQ Express must be connected to PC to extract the information from the dock)

In the event that an instrument fails the bump test, or if the instrument's calibration due date has passed, the IQ Express will automatically proceed to a full calibration without further intervention from the user.

If the instrument fails any of the tests listed above, the IQ Express will notify the user through the display on the dock, and through the PC if the dock is connected to the PC and the software is running.

Results of tests and calibration attempts are stored in the dock and uploaded to the PC if the software has been loaded and the USB or Ethernet connection is active.

IQ Express software versions greater than 3.0 will have the ability to download the contents of the instrument's datalogger and eventlogger into a file on the PC that may be opened with BioTrak software. The IQ Express must be connected to the PC for the download to occur.

IQ Express software versions greater than 6.20 have the ability to update the ToxiPro's firmware/flash file.

1.2 PC Connection

1.2.1 USB Connection

To enable the interface from the IQ Express to the PC, first install the IQ Express Configuration Software and IQ Database Manager Software. Then connect the PC to the IQ Express Dock with the USB cable that is included at the time of purchase.

See section 2 for more detailed setup instructions.

1.2.2 Ethernet Connection and E-mail

IQ Express Docks with the Ethernet upgrade may be connected to the PC via USB or via a network. To connect via Ethernet, follow the directions given in the IQ Express Ethernet Instructions booklet.

Docks that are connected by Ethernet have additional controls at the PC to ping the dock, to view the Ethernet settings and to view and test the e-mail system.

E-mail may be sent by the dock to a single e-mail address when a fault is detected at the dock, but for no other reason. The dock must be connected to a network via Ethernet for the e-mail function to work. E-mail capability is controlled entirely through the IQ Database Manager Pro program. For more information on the e-mail function see Ethernet Controls in section 3.2.1 below or the IQ Database Manager Pro manual.

1.3 PC Requirements

- Pentium Processor 1.0GHz or better or equivalent.
- 256MB RAM.
- Windows 2000 Pro / XP / Server 2003
- 50MB hard drive disk space.

1.3.1 Ethernet Requirements

To be Ethernet compatible, the IQ Express Dock must have Flash version 4.00 or higher and must be equipped with an Ethernet port.

PC Software must be version 4.00 or higher to support Ethernet connections.

1.4 Instrument Firmware Requirements

Instrument firmware version 4.3 or higher is required in the ToxiPro, OxyPro, ToxiLtd or OxyLtd for compatibility with the IQ Express.

Firmware upgrades to the ToxiPro and OxyPro may be made with a PC through the IrDA port. Instrument firmware upgrades are available free of charge through Sperian Instrumentation's download website:

http://www.biodownloads.com

ToxiLtd and OxyLtd instruments must be returned to Sperian Instrumentation for firmware upgrades. Call Sperian Instrumentation for a Return Authorization number (RA#) before shipping.

1.5 Power Requirements

The IQ Express Dock is delivered with an appropriate power supply and a variety of adapters. The IQ Express Dock must be plugged into an appropriate electrical outlet using the power supply / wall cube that was included with the dock at the time of purchase.

If multiple IQ Express docks are purchased with the IQ Express Mounting Bracket, an optional power supply is available that is capable of running up to four IQ Express Docks from a single electrical outlet.

Note: If the IQ Express Dock(s) is to be installed on the IQ Express Mounting Bracket, follow the instructions that were sent with the bracket.

1.5.1 Dock with direct USB Connection to PC

The IQ Express must be plugged into an appropriate electrical outlet using the power supply / wall cube that was included with the dock at the time of purchase. A USB cable is included to connect the dock to the PC with the USB cable.

1.5.2 Multi-Dock Setup with USB Connection

For multi-dock configurations each dock must be powered using the power supply that was included with the dock. An alternate option is to purchase the optional power supply that is capable of running up to 4 IQ Express Docks. Under no circumstances can multiple IQ Express Docks be run from a single USB port regardless of whether it is a powered or non-powered hub.

Power and Connectivity are discussed in greater detail in section 2.6.

1.6 Sensor compatibility

Standard versions of the IQ Express Dock are capable of processing instruments containing the following sensor types: O_2, CO and H_2S.

Enhanced versions of the IQ Express Dock are capable of processing instruments with all of the sensors listed above plus ToxiPro instruments for SO_2, Cl_2, NO_2, NH_3, HCN and PH_3.

1.7 Default Calibration Gas Settings and Dock Compatibility

Dock Setting	Default Cal Gas Setting	Dock Type S=Standard E=Enhanced
CO	50 PPM	S,E
H_2S	25 PPM	S,E
CO / H_2S	50 PPM CO / 25 PPM H2S	S,E
SO_2	10 PPM	E
Cl_2	10.0 PPM	E
NO_2	5.0 PPM	E
NH_3	50.0 PPM	E
HCN	10.0 PPM	E
PH_3	5.0 PPM	E

Default Calibration Gas Settings and Dock Requirements

1.8 Calibration Gas Cylinder Regulator Requirements

A demand-flow regulator must be used with the IQ Express.

1.9 Delivery

Each IQ Express Calibration Station is delivered with the following items:

- IQ Express
- IQ Express Configuration Software
- IQ Database Manager Software
- USB Cable
- Power Supply
- Standard versions are delivered with a 2' piece of calibration gas tubing with pre-installed white quick disconnect fitting.
- Enhanced versions are delivered with a calibration gas tubing assembly comprising a 1" piece of standard tubing connected to a black elbow fitting, which is then connected to a 2' long piece of smaller diameter tubing with pre-installed white quick disconnect fitting.

2. Installation

The IQ Express must be configured with a PC prior to use. Once the dock has been configured, it may be used as a stand-alone calibration station without a PC connection, or connected to a PC via USB cable or Ethernet for increased control over system operations.

Note: If the dock is configured for an Ethernet connection, specific instructions for Ethernet are included with the dock.

Unless otherwise specified at the time of purchase, all IQ Express Docks are shipped from Sperian Instrumentation configured for CO/H_2S instruments with the standard calibration gas settings.

If the user chooses to activate the IQ Express without a PC connection, or if the PC connection has been lost, the dock will operate with the last set of calibration gas settings that were uploaded into the instrument and will automatically store calibration data until the onboard memory is full.

Note: Do not connect the IQ Express Dock to the PC until the IQ Express and IQ Database Manager Software have been installed and the PC has been restarted.

2.1 Installation Overview

1. Install the PostGreSQL Database and the IQ Administrator Pro program. See section 2.2 below.
2. Install the IQ Database Manager program as described in section 2.3.
3. Install the IQ Express PC Software as described below in section 2.4.
4. Use Administrator Pro to create a default PostgreSQL database as described below in section 2.5.
5. Follow the instructions in section 2.6 for connecting the IQ Express Dock(s) to the PC via USB. Follow the Ethernet Instructions booklet if connecting by Ethernet.
6. Follow the instructions in section 2.7 for connecting the calibration gas cylinders.
7. For docks that will be connected permanently by USB port, configure the docks by connecting them to the PC's USB port. For an Ethernet connection, follow the Ethernet Instructions that came with the dock.

See Appendix A for the USB Connection Diagram.

2.2 IQ Administrator Pro and PostgreSQL Database Server Installation

The IQ Administrator Pro Program is contained on the IQ Express Installation Disk. Place the disk in your PC's CD tray and follow the installation instructions given

in the IQ Administrator Pro Reference Manual that is included with the IQ Express Dock.

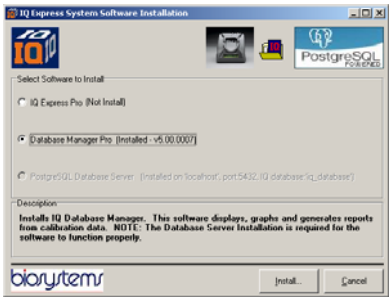
2.3 IQ Database Manager Software Installation

The Database Manager Pro Program is contained on the IQ Express Installation Disk. Place the disk in your PC's CD tray and follow the installation instructions given in the IQ Database Manager Software manual that is included with the IQ Express.

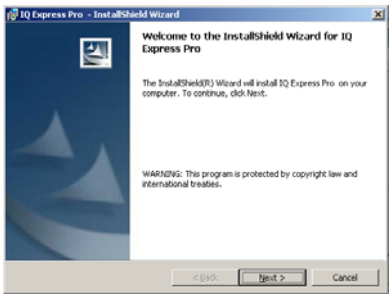
2.4 IQ Express PC Software Installation

Note: Screens shown below may be slightly different depending on your PC's operating system.

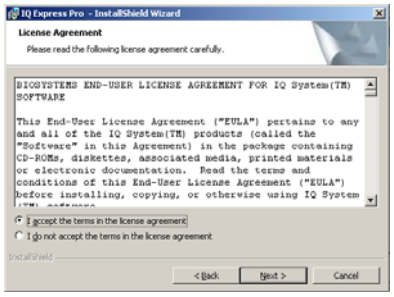
1. The Software Installation screen should come up automatically once the installation of Database Manager is complete. If this screen does not come up, access the CD drive using Windows Explorer.


IQ Express System Software Installation
Select Software to Install
IQ Express Pro (Not Install)
Database Manager Pro (Installed - v5.00.0007)
Description
Installs IQ Database Manager. This software displays, graphs and generates reports from calibration data. NOTE: The Database Server Installation is required for the software to function properly.
biosystems
Install...
Cancel

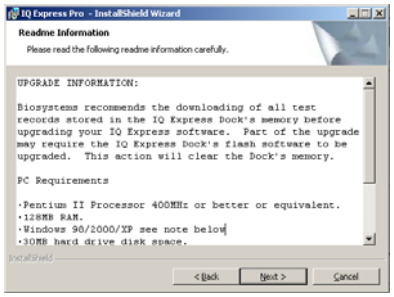
2. Select IQ Express Pro and click "Install". The InstallShield Wizard will begin the installation.


IQ Express Pro - InstallShield Wizard
Welcome to the InstallShield Wizard for IQ Express Pro
The InstallShield(R) Wizard will install IQ Express Pro on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

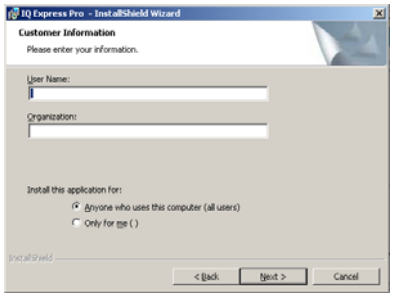
3. Click "Next" to continue with the installation. The Licensing Agreement screen will be shown.


IQ Express Pro - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
BIOSYSTEMS END-USER LICENSE AGREEMENT FOR IQ System(TM) SOFTWARE
This End-User License Agreement ("EULA") pertains to any and all of the IQ System(TM) products (called the "Software" in this Agreement) in the package containing CD-ROMs, diskettes, associated media, printed materials or electronic documentation. Read the terms and conditions of this End-User License Agreement ("EULA") before installing, copying, or otherwise using IQ System
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

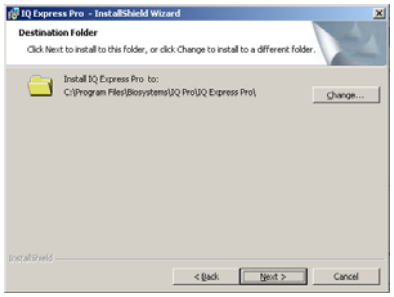
4. If you accept the terms of the License Agreement, click "I accept....." and then click "Next" to continue. The upgrade information and PC requirements will be shown.


IQ Express Pro - InstallShield Wizard
Readme Information
Please read the following readme information carefully.
UPGRADE INFORMATION:
Biosystems recommends the downloading of all test records stored in the IQ Express Dock's memory before upgrading your IQ Express software. Part of the upgrade may require the IQ Express Dock's flash software to be upgraded. This action will clear the Dock's memory.
PC Requirements
·Pentium II Processor 400MHz or better or equivalent.
·128MB RAM.
·Windows 98/2000/XP see note below
·30MB hard drive disk space.
InstallShield
< Back
Next >
Cancel

5. Click "Next" to continue. The Customer Information screen will be shown.

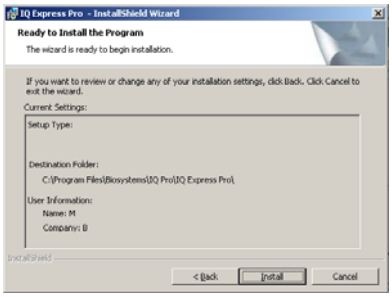


6. Enter the name of the user and the name of the organization. Then select whether this application may be used by "Anyone who uses this computer" or "Only for me". Then click "Next. The destination folder screen will be shown.

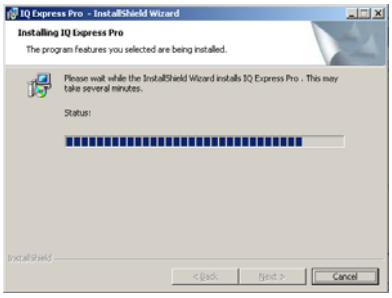

IQ Express Pro - InstallShield Wizard
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install IQ Express Pro to:
C:\Program Files\Biosystems\IQ Pro\IQ Express Pro\
Change...
InstallShield
< Back
Next >
Cancel

7. To install IQ Express in the default directory at "C:\Program Files \ Biosystems \ IQ Express", simply click "Next". To install the files to another directory, click "Browse" and use Windows Explorer to specify the new location. Click "Next" once this is

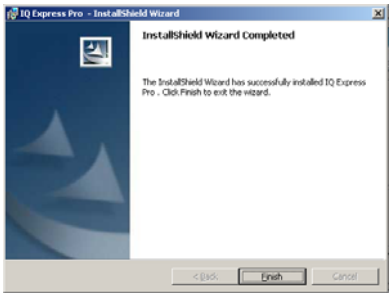
accomplished. The following screen will then be shown.


IQ Express Pro - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
Current Settings:
Setup Type:
Destination Folder:
C:\Program Files\Biosystems\IQ Pro\IQ Express Pro\
User Information:
Name: M
Company: B
InstallShield
< Back
Install
Cancel

8. Click "Next" to continue. The status of the file decompression will be shown.


IQ Express Pro - InstallShield Wizard
Installing IQ Express Pro
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs IQ Express Pro . This may take several minutes.
Status:
InstallShield
< Back
Next >
Cancel

Once the installation is complete, the following screen will be shown:


IQ Express Pro - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed IQ Express Pro . Click Finish to exit the wizard.
< Back
Finish
Cancel

9. Click Finish to conclude the installation. The IQ Express logo will appear on your desktop.

Note: Do not launch the IQ Express Software again until the instructions in sections 2.5 – 2.8 below have been completed.

2.5 Install IQ Administrator Pro and PostgreSQL database.

Proceed to the IQ Administrator Pro Reference Manual section 6 and follow the instructions to create and specify the PostgreSQL database.

2.6 Power and Connectivity

This section covers providing power to the IQ Express Docks and connecting them to your PC. The instructions given below pertain to standard connections via the PC's USB port.

Note: Disregard this section if you are planning to connect the docks via Ethernet or if you have purchased the IQ Express Mounting Bracket.

IQ Express Docks that are Ethernet-ready are shipped with an Ethernet Instructions booklet. Proceed to the Ethernet Instructions booklet if you are planning to connect the dock to the PC via Ethernet. Once the instructions in the booklet have been followed and the IQ Express Dock is connected, return to section 2.7 for calibration gas cylinder connection instructions.

If you have purchased the IQ Express Mounting Bracket, proceed to the Assembly Instructions for IQ Express Mounting Bracket. Once the docks are correctly installed on the mounting bracket, proceed to section 2.7.3 for instructions concerning the Fresh Air Port(s).

2.6.1 PC – Single Dock via USB

The IQ Express must be plugged into an appropriate electrical outlet using the power supply / wall cube that was included with the dock at the time of purchase. After connecting the dock to the PC with the USB cable that was included with the dock, proceed to section 2.7 for instructions on connecting calibration gas cylinders.

NOTE: USB cable length from PC to dock may not exceed 10 feet.

2.6.2 PC – Multi Dock via USB

For multi-dock configurations each dock must be powered using the power supply that was included with the dock. An alternate option is to purchase the optional power supply that is capable of running up to 4 IQ Express Docks. Under no circumstances can multiple docks be run from a single USB hub regardless of whether it is a powered or non-powered hub. Once the power requirement for each dock is satisfied the USB connection to the PC can be made by using a USB hub or by directly connecting the USB cable to the PC.

2.7 Connecting the Calibration Gas Cylinder(s) to the Dock(s)

Connection requirements for calibration gas cylinders vary with how many docks will be connected to the cylinder and whether the calibration gas is considered reactive. Enhanced versions of the IQ Express include a tubing assembly that is suitable for use with reactive gases.

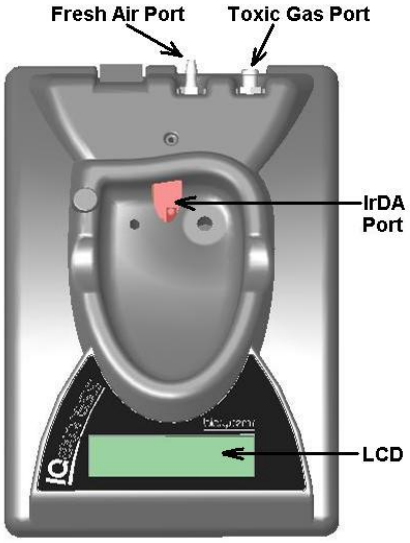


Figure 2.7 IQ Express Gas Ports

For instructions on connecting the gas cylinder to a single IQ Express dock proceed to section 2.7.1.

For instructions on connecting the gas cylinder to multiple IQ Express docks proceed to section 2.7.2.

2.7.1 Single Cylinder to Single IQ Express Dock

1. Insert the demand flow regulator into the calibration gas cylinder.
2. Standard docks are delivered with a 24" piece of tubing with a white quick disconnect on one end. Enhanced docks are delivered with a 24" piece of tubing that meets a black elbow fitting followed by a 1" piece of standard tubing. Slide the open end of the tubing assembly over the regulator. For enhanced docks, slide the open end of the 1" piece of tubing over the regulator.

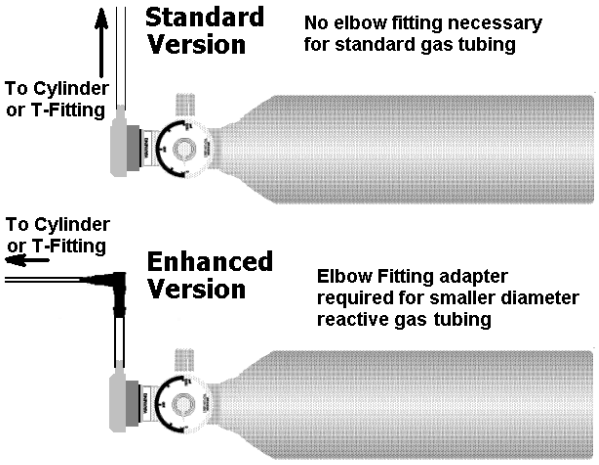

Standard Version
No elbow fitting necessary for standard gas tubing
To Cylinder or T-Fitting
To Cylinder or T-Fitting
Enhanced Version
Elbow Fitting adapter required for smaller diameter reactive gas tubing

Figure 2.7.1 Standard versus Enhanced Setup for Regulator and Tubing

Note that the tubing assemblies for the standard and the enhanced versions of the IQ Express Docks are different. The tubing assembly for the enhanced versions includes a black elbow fitting that should be located just above the regulator.

3. Connect the end of the tubing with the white quick disconnect fitting to the toxic GAS port on the IQ Express Dock (see figure 2.7 above for location of the GAS port).
4. Proceed to section 2.7.3 for further instructions concerning the fresh AIR port.

2.7.2 Single Cylinder to Multiple Docks

When a series of IQ docks is connected to a single cylinder of calibration gas, a manifold is used to disperse the calibration gas from the cylinder to the docks.

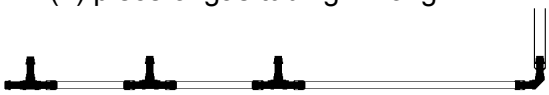
The manifold is part number 54-46-115 and includes a detailed instruction sheet for its use. The manifold comes with tubing and fittings necessary for connecting up to 4 Express Docks to a single cylinder of calibration gas.

Note: Do not exceed the output capacity of your demand flow regulator. Each IQ Express dock is able to draw calibration gas at a maximum rate of 0.75 liters/minute. The demand flow regulator supplied by Sperian Instrumentation (part number 12-039) has a maximum output capacity of 3 liters per minute, so it can be used to calibrate up to 4 docks simultaneously. Do not connect more than 4 docks to a single cylinder of

calibration gas while using the 12-039 demand flow regulator.

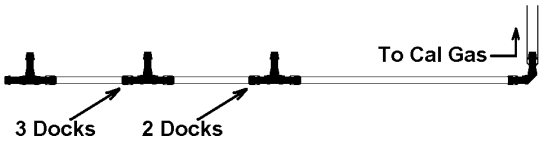
The 54-46-115 manifold is comprised of:

(1) small black elbow fitting
(3) small black T-fittings
(2) pieces of gas tubing 5” long
(1) piece of gas tubing 10” long
(1) piece of gas tubing 1” long



54-46-115 Manifold

1. Insert the Demand Flow Regulator into the calibration gas cylinder.
2. Modify the tubing assembly as follows depending on how many docks will be connected. If 4 docks will be used, no modifications are necessary. For 2 or 3 docks, begin by separating the tubing at the location described below.



Tubing Separation Points

Once this is accomplished, set the two parts aside. The section that will be used is shown in the following images (depending on the number of docks).

Manifold for two docks

Manifold for three docks

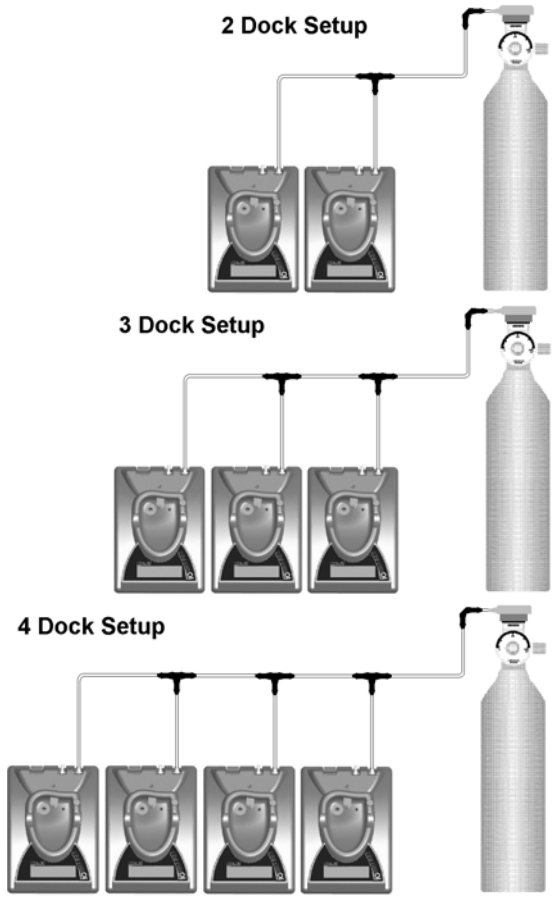
Manifold for four docks

3. Each dock is delivered with a 24” piece of tubing with a white quick disconnect fitting, which is normally used to connect a single gas cylinder directly to a single dock. Connect the white quick disconnect fittings to the GAS ports on the docks and connect the open ends to the manifold’s open t-fittings. For enhanced docks, remove the black elbow fitting entirely from the 24” piece of tubing and run the smaller diameter tubing directly from the docks to the open T-fittings.

At this point, tubing should run from each dock’s GAS port to the t-fittings. There should be no open T-fittings at this point in the procedure, but there should be one piece of open tubing on the elbow fitting.

4. Connect the open piece of tubing on the elbow fitting to the Demand Flow Regulator.

Final Appearance

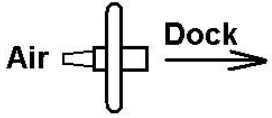


Note: Tubing lengths in these images are not to scale.

2.7.3 Fresh Air Port Instructions

The Fresh Air Port is used to draw the fresh air sample into the dock for instrument processing. Check valves and/or fresh air filters are required depending on how fresh air is delivered to the dock. See the chart below for specific requirements for your setup. The fresh air filter is placed on the Air Port at the dock to protect the dock from contaminants. Check valves are used to ensure the purity of external fresh air sources when more than one dock is used.

	Air Filter at Dock	Check Valve(s)
Single Dock in Fresh Air	Yes	N/A
Multiple Docks in	Yes	N/A



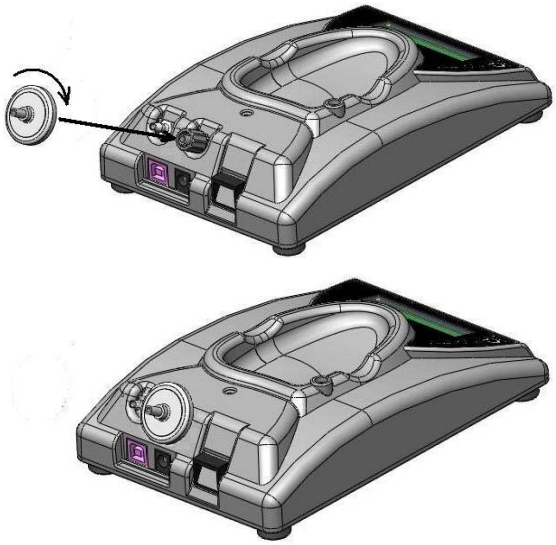
Fresh Air		
Single Dock w/Zero Air Cylinder	No	No
Multiple Docks w/Zero Air Cylinder	No	Yes
Single Dock w/Sealed Fresh Air Conduit	Yes	No
Multiple Docks w/ Sealed Fresh Air Conduit	Yes	Yes

Air Filter / Check Valve Requirements Chart

Fresh Air Filter

Under normal circumstances, the IQ Express Dock is located in a fresh air environment and fresh air is drawn in from the local environment. A filter is included with the dock that is used to protect the dock from contaminants that may inadvertently enter the dock. The air filter should be installed if the dock is drawing fresh air from the immediate surroundings or if it is drawing fresh air from an external source via a sealed conduit. The fresh air filter can be left off if the fresh air source is a calibration cylinder.

Only one side of the filter will screw into the Air Port on the dock.



Providing Fresh Air in a Contaminated Environment

If the IQ Express is to be located in a potentially contaminated environment, fresh air must be delivered to the Air Port on the dock for use during instrument processing. This can be accomplished either by using a cylinder of "zero air" with a demand flow regulator (option 1 below) or by plumbing fresh air into the dock in a sealed conduit from an outside location that has known fresh air (option 2 below).

⚠WARNING Performing the fresh air calibration in a contaminated atmosphere will lead to inaccurate and potentially dangerous readings. Fresh air containing 20.9% oxygen and no contaminants must be provided to the IQ Express Dock for instrument processing. If fresh air is unavailable in the immediate area, steps must be taken to provide fresh air to the dock.

When a secondary fresh air source (either gas cylinder or sealed conduit) is used with two or more IQ Express Docks, a one-way check valve must be placed in line between the common section of the fresh air manifold and each of the docks to ensure the purity of the fresh air source. See the section below titled "Fresh Air Manifold" for further instructions.

Option 1: Using a Gas Cylinder to Provide Fresh Air to the Dock

A calibration cylinder containing "zero air", which contains 20.9% oxygen and no contaminants may be connected to the gas port labeled "AIR" to provide fresh air to the dock for calibration. The cylinder must be equipped with a demand flow regulator. The connection from the cylinder and regulator to the dock may be made with standard gas tubing.

For single docks, simply connect the "zero air" cylinder and demand flow regulator to the dock's AIR port using standard gas tubing. A check valve is not necessary when a cylinder is used to provide fresh air to a single dock. The fresh air filter is also not required in this configuration.

For multiple dock setups (up to 4), a one-way check valve must be placed in the line between each T-fitting and dock to ensure the purity of the fresh air source. See "Multi-Dock Setups with Fresh Air Manifold" below for further instructions. The fresh air filter is not necessary when a gas cylinder is used to provide fresh air to the dock(s).

Option 2: Using a Sealed Conduit to Provide Fresh Air to the Dock

Fresh air may also be delivered to the dock from a known fresh air source via a sealed conduit that feeds directly from the source into the AIR port on the dock.

For single docks, install the fresh air filter as discussed above and simply plumb the fresh air source directly into the dock's AIR port.

For multiple dock setups in which fresh air is provided to the dock via sealed conduit, begin by installing the fresh air filter on each dock. A one-way check valve must be placed in the line between the t-fitting in the fresh air manifold and each dock to ensure the purity of the fresh air source. See "Multi-Dock Setups with Fresh Air Manifold" below for further instructions.

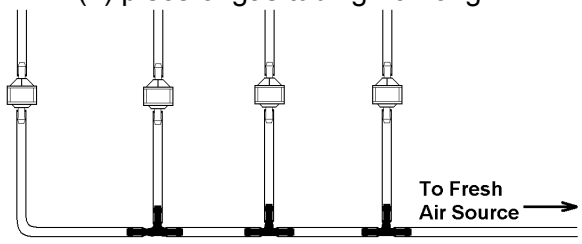
Multi-Dock Setups with Fresh Air Manifold

For more information on this, see Applications Note # AN20050722, which is available at http://www.sperian.com.

The 54-46-116 manifold is necessary for use when more than one dock is to be used with an external fresh air source, whether is be a cylinder of "zero air" or a sealed conduit to a fresh air source.

The 54-46-116 manifold is comprised of:

(3) small black T-fittings
(4) clear one-way check valves
(10) pieces of gas tubing 5" long
(1) piece of gas tubing 10" long

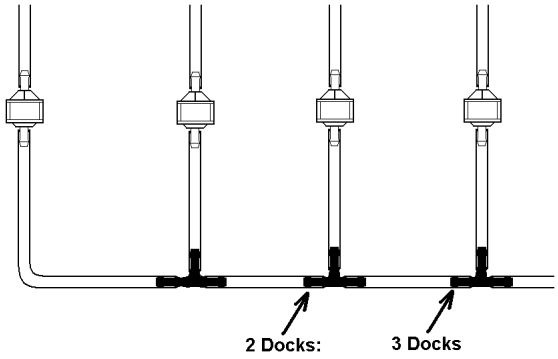


54-46-115 Tubing Assembly

1a. If the fresh air source is a calibration gas cylinder, insert the Demand Flow Regulator into the calibration gas cylinder and proceed to step 2.

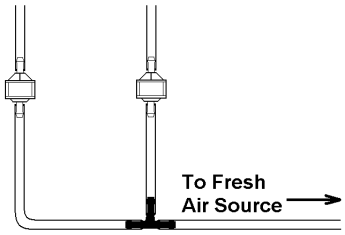
1b. If the fresh air source is a sealed conduit from an external fresh air source, install the fresh filter on each dock as described above and proceed to step 2.

2. Modify the tubing assembly as follows depending on how many docks will be connected. If 4 docks will be used, no modifications are necessary. For 2 or 3 docks, begin by separating the tubing at the location described below.

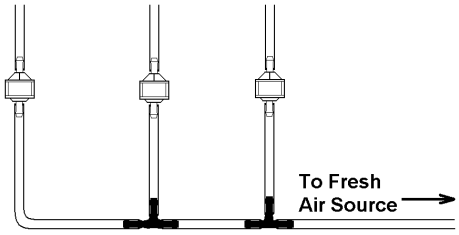


Tubing Separation Points

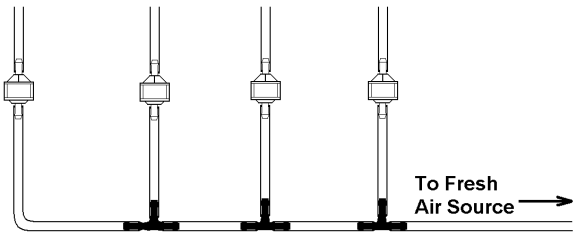
Once this is accomplished, set the two parts aside. The section that will be used is shown in the following images (depending on the number of docks).



Fresh Air Tubing for 2 Docks



Fresh Air Tubing for 3 Docks



Fresh Air Tubing for 4 Docks

3. Connect the pieces of tubing above the check valves to filter that was installed on the dock in step 2.

At this point, the tubing assembly should be connected to each dock's AIR port.

4. Connect the only open piece of tubing (below the black t-fittings) to the demand flow regulator on the gas cylinder or to the conduit for the external source of fresh air.

2.8 Dock Setup

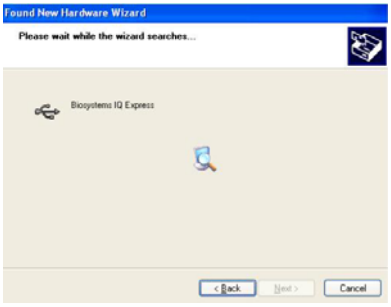
Once the software has been installed, and the USB wire(s) is/are plugged into the PC,

the Found New Hardware Wizard screen will be shown on the PC.

NOTE: These screens vary depending on your PC's operating system.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Biosystems IQ Express
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

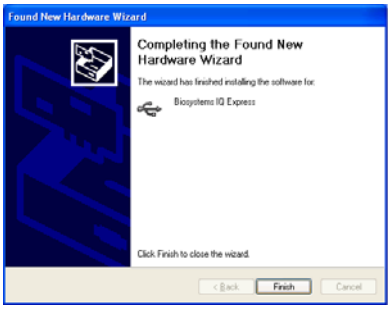
Click Next to continue. The Wizard will proceed to search for the USB drivers.



If installing to XP, the following screen will be shown and should be disregarded.

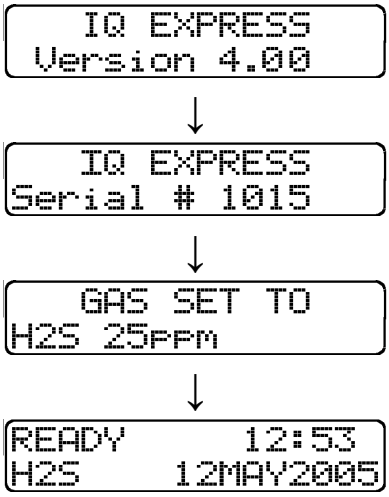
Hardware Installation
The software you are installing for this hardware:
Biosystems IQ Express
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Click "Continue Anyway" (XP Only). The software will notify you when the process is complete.



Click "Finish".

The IQ Express Dock will display its software version number, serial number, and the calibration gas type and expected calibration gas concentration whenever it is plugged in. The IQ Express is ready to go once it displays "READY" with the gas type, time and date.

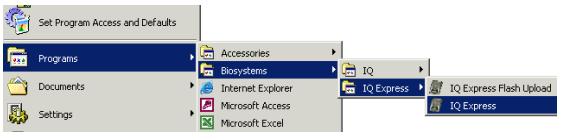


3. Software

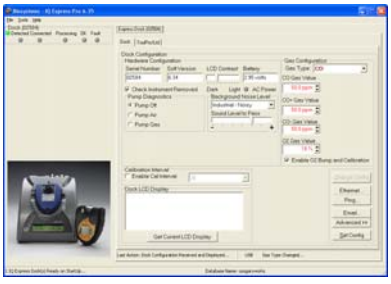
To launch the IQ Express Software, click on the IQ Express icon on your PC's desktop.

Note: Do not launch the software until the installation instructions in section 2.1 – 2.8 have been completed.

The software may also be launched by accessing the program through the start button and selecting Programs / Biosystems / IQ Express / IQ Express (unless another location was specified during the installation).



Once the IQ Express Software is launched, the following screen will be shown.



The screen is divided into right and left sides. The left side gives the status of the docks that are currently installed and recognized. At the top of the right side of the screen there is a tab for each dock that is currently installed and recognized. Within each dock tab are two sub-tabs: one for

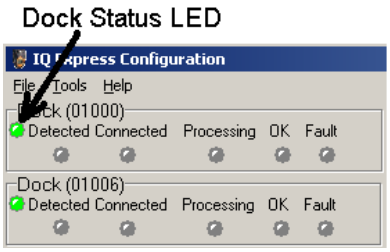
dock controls and one that shows the calibration status and details for the instrument that is currently in the dock.

3.1 Dock Status

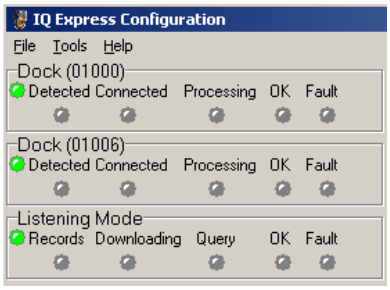
3.1.1 Dock status LED

The status bars at the far left show the status of the docks that are currently registered on the PC.

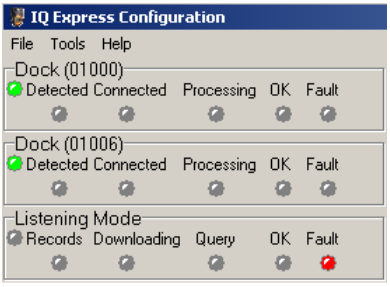
Each dock that is currently connected to the PC by either USB or by a “Live” Ethernet connection will have a distinct status bar. The green LED at the far left shows the general status of the dock.



All docks that are connected via Ethernet and are currently in “Listening Mode” are given a single status bar.



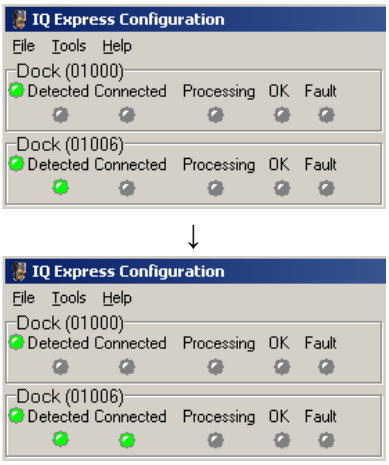
For docks in Listening Mode, if a single fault is detected on any of the docks, the dock LED will turn grey and the Fault LED will turn red.



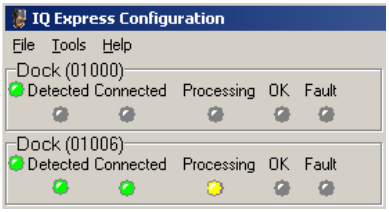
Specific information for individual docks in “Listening Mode” can be accessed via the Express Dock (Listening Mode) tab on the right side on the screen. See section 3.2 for more information.

3.1.2 Instrument status LEDs

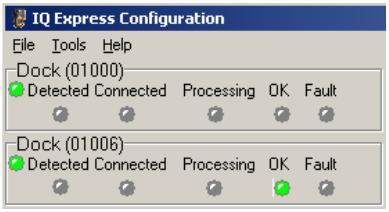
When a detector is placed in the dock, the indicator will change to reflect the new status. Status changes are also be shown on the dock’s LCD.



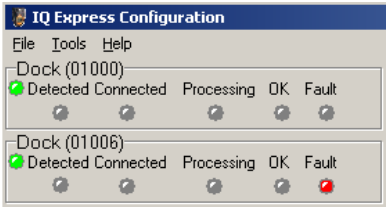
Processing is shown in yellow.



If the dock is able to successfully complete processing, OK will be shown in green.



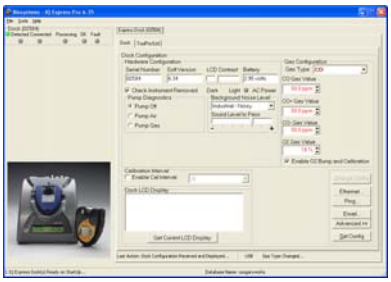
If a fault is detected and the IQ Express Dock is unable to complete the tests, the red fault light will be lit on the screen. Details of the fault will be listed in the input box on the right side of the screen under the instrument tab. See section 3.2.2 for details.



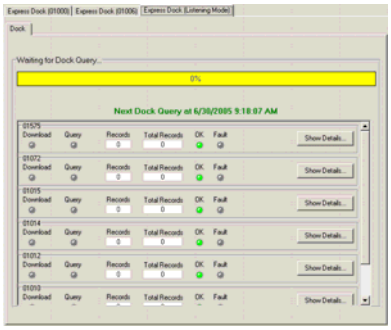
⚠WARNING Do not reinsert the ToxiPro or ToxiLtd back into an IQ Express Dock for at least 5 minutes after it has been removed. Immediate reinsertion of the ToxiPro or ToxiLtd into an IQ Express Dock may lead to inaccurate and potentially dangerous readings.

3.2 Dock Controls and Instrument Status

The right side of the screen contains individual controls for each IQ Express Dock that is connected by USB or by a “Live” Ethernet connection. Each dock has its own page, which can be accessed by clicking on the appropriate tab at the top of the page. Within each dock’s page are two sub-tabs. One contains specific information on the dock itself. The other displays information on any instruments that are currently recognized in the dock.



The last tab on the left accesses all of the IQ Express Docks that are connected by Ethernet and in “Listening Mode”.



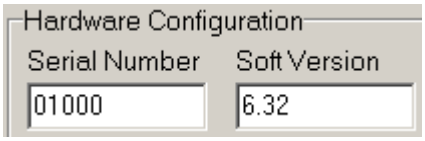
3.2.1 Dock Configuration

Click on the Dock tab to access the dock settings.

To change the configuration of the IQ Express Dock that is currently connected to the PC, click on the “Change Config” button at the lower right of the screen. Once the dock configuration is uploaded, the “Set Config” button will be enabled. Once changes are made, click on the “Set Config” button to save the new settings.

Hardware Configuration

The hardware configuration section contains the serial number and software version number of the IQ Express Dock at the upper left corner.



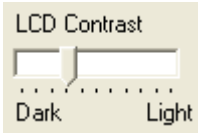
This information may not be arbitrarily changed with the software. Software updates will cause the software version to change.

AC Power

The AC Power indicator is located directly beneath the connection speed setting. If the dock is being powered by the USB cable, the AC Power will appear grey. When the dock is being powered by an AC power source, the AC Power indicator will appear green.

LCD Contrast Control

At the right side of the Dock Configuration box is the LCD Contast.



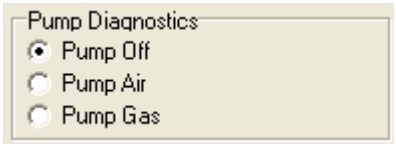
To darken or lighten the LCD on the IQ Express Dock, move the slider as appropriate.

Battery

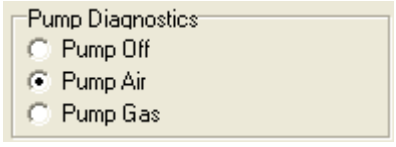
The battery level shown on the dock tab is for the internal battery in the IQ Express Dock. This battery serves to keep the real time clock accurate while the dock is unplugged and should not be a concern to the user unless the battery level drops below 2.50 Volts.

Pump Diagnostics

Pump diagnostics are controlled through the Pump Control section on the Dock Settings page.



Click “Pump Gas” to draw span calibration gas through the right gas port at the back of the dock. Click “Pump Air” to draw the fresh air sample through the left gas input port.

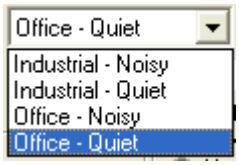


Either pump will run until “Pump Off” is selected.

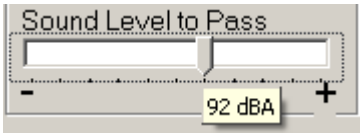
Audible Alarm Sensitivity Controls

The audible alarm sensitivity controls allow the user to customize the audible alarm test criteria.

The Background Noise Level adjustment offers four levels of background noise levels. For the best results, select the one that most closely approximates the background noise level expected during testing.



The Minimum Sound Level setting determines the minimum amount of sound required to pass the alarm test. The setting is controlled by a slider. The higher the setting, the louder the alarm will need to be to pass the test. The sound level is given in decibels when the cursor is placed over the slider.



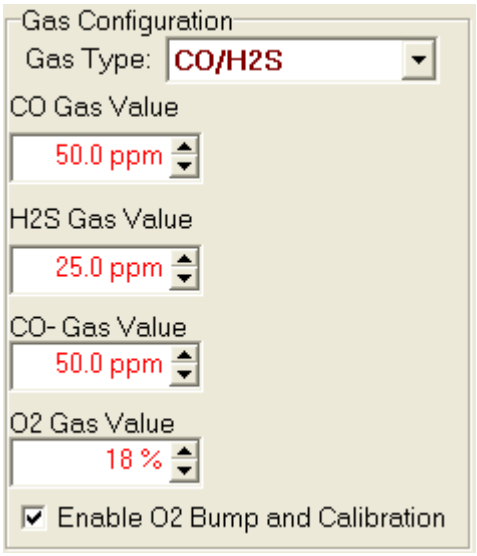
Calibration Interval

The Dock's calibration interval settings are controlled from the Dock Tab and are located below the battery level and above the LCD Display box. The dock's calibration interval is the maximum number of days that the dock will allow to pass between calibrations for any instrument that is placed in the dock. If an instrument is placed in the dock and the interval has been exceeded, the dock will automatically initiate a full span calibration of the instrument regardless of the results of the bump test or the instrument's own calibration status.

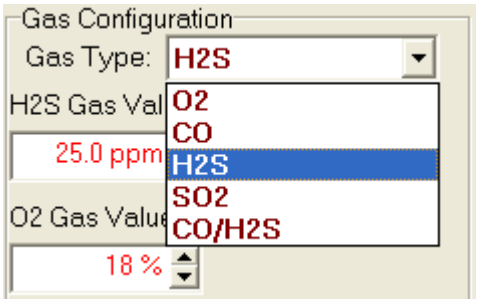
To use the setting, click on Enable Cal Interval and set the interval to the number of days between calibrations. **Note that this setting overrides the instrument's own calibration due reminder and may cause the instrument to undergo a full calibration even when the instrument itself is not due for calibration.**

Gas Configuration

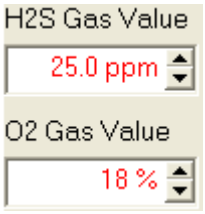
The calibration gas configuration settings are located at the right side of the dock tab. The Gas Type and Gas Value should be set to exactly match the type and amount of each component of the gas cylinder that is connected to the inlet port on the dock.



To change the gas type, click on the down arrow to the right of the gas setting and select the new gas type.



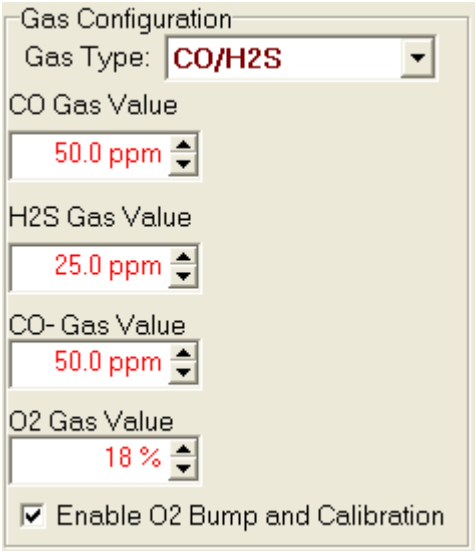
Once the gas type is chosen, enter the calibration gas composition, including the values for any toxic gases in the cylinder in terms of parts-per-million (ppm) and the oxygen level in terms of percent volume (%). To change a gas value use the arrows to the right of the gas value input box to increase or decrease the value until it matches the value given on the gas cylinder.



Since a common calibration gas mixture includes CO and H_2S, a CO/H_2S option is available that offers distinct settings for CO

and H_2S. This allows the dock to process CO, CO- and H_2S units without changing the gas setting.

Note: Due to cross-sensitivity issues, CO+ detectors must be calibrated with CO calibration gas only. A CO+ detector placed in a dock that is configured for CO/H2S will automatically fail to process.



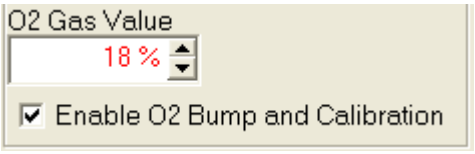
The IQ System will automatically fail any detector that is processed when the calibration gas type fails to match the sensor type.

⚠WARNING Calibration values shown in the Gas Value column must match those appearing on the calibration gas cylinder(s) that will be used to calibrate the detector. Non-matching calibration gas and calibration gas value settings will lead to inaccurate and potentially dangerous readings.

Special Instructions: Gas Configuration, Oxygen Detectors

An oxygen detector can be processed by the IQ Express in a fresh air atmosphere without the use of calibration gas, but an optional bump test is available to verify oxygen sensor response. The O2 Bump and Calibration is automatically enabled at the factory. If the user wishes to bypass the oxygen bump test, the O2 Bump and Calibration option can be disabled by deselecting the "Enable….": check box at the bottom of the Gas Configuration settings.

Each calibration gas type includes an oxygen setting that should reflect the amount of oxygen in the calibration gas cylinder (typically 18%).



With the O2 Bump and Calibration option enabled, when an oxygen detector is placed in the dock, the system will proceed with an oxygen bump test based on the O_2 gas value that has been entered. If the bump test fails, the dock will show a warning on the screen that the instrument has failed the test.

A special case exists when a cylinder of 0.0% oxygen calibration gas is connected to the dock. If the O2 Gas Value is set to 0.0% oxygen and the instrument fails the bump test, it will automatically attempt a full zero calibration at 0.0% oxygen.

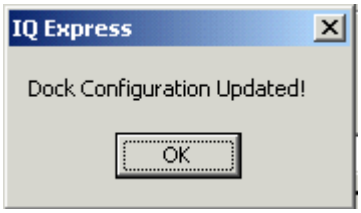
For all other levels of calibration gas (>0.0%), the oxygen bump test is the only test available. The zero calibration of the oxygen sensor is only available with calibration gas containing 0.0% O_2.

To disable the O2 Bump and Calibration deselect the option.

Saving new settings

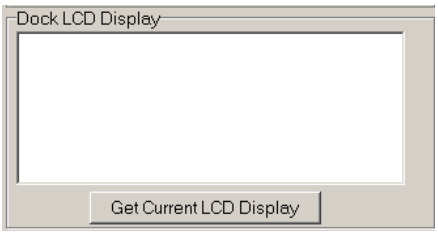
When all necessary changes have been made, press the "Set Configuration" button (in the lower right corner of the screen) to upload the new settings to the IQ Express Dock.

The software will notify you once the dock configuration has been updated.

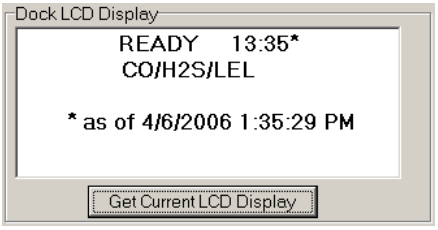


Dock LCD Display

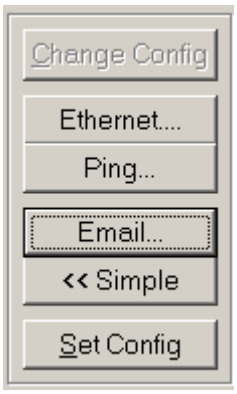
At the lower left corner of the Dock status tab is Dock LCD Display window. This is most often used when a dock is controlled remotely via Ethernet where the PC user is unable to physically see the dock.



To view the dock's Display, click on "Get Current LCD Display".

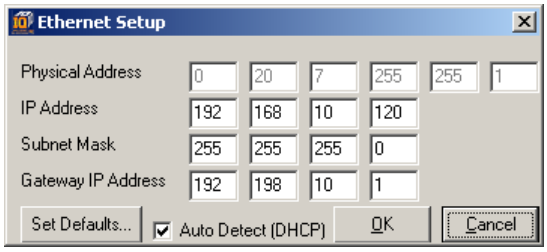


Ethernet Controls

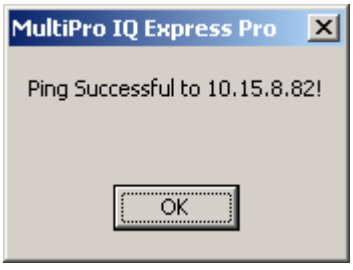


For docks that are connected by Ethernet, there are three additional controls on the lower right corner of the display: Ethernet, Ping and E-mail.

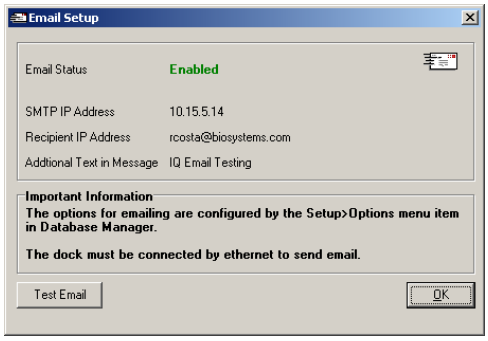
To view the Ethernet settings, click on the Ethernet button



To test the dock connection, press the Ping button. A status window will be shown to indicate whether the ping was successful or not.



The dock's e-mail settings are controlled through the Database Manager Pro program, but can be viewed by clicking on the e-mail button. The e-mail status, IP Address of the dock, recipient e-mail address and text of the e-mail message are shown.

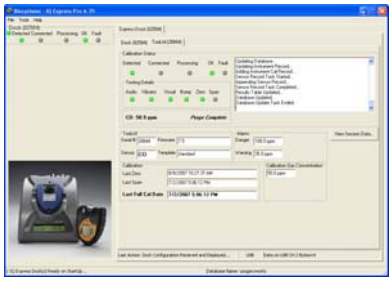


To test the e-mail ability of the dock, press the Test E-mail button at the lower left. An e-mail will be generated and sent to the recipient e-mail address that is listed.

Press OK to close the Email Setup window.

3.2.2 Instrument Tab

The ToxiPro/Ltd tab shows instrument information for the detector that is currently in the IQ Express Dock. The right side of the tab is identical to the Dock Status tab section discussed above. The blank space at right shows is an output box that shows detailed instrument information as it is processed.



The output box is updated as the instrument is processed. If any faults occur, the details of the fault will be shown and a red fault light will be shown. In the image below, a span calibration failure is the cause of the fault.

If the datalogger has been downloaded, the "View Session Data" control will appear on the right. Click on "View Session Data" to directly access individual session files for the instrument. The session files can be accessed using the BioTrak Program.

If the dock is currently empty, none of the status indicators will be lit and the output box will be blank.

3.3 Advanced Settings / Passcode

The IQ Express Dock may be set to verify a specific 4-digit passcode (PIN) in any instrument that interfaces with the dock. If the dock detects a PIN in the instrument that matches its own PIN, it will process the instrument. If the dock fails to detect a PIN, or recognizes a non-matching PIN, it will not process the instrument.

To use the passcode feature a PIN must be entered into the IQ Express Software and then uploaded to every instrument that will interface with the dock. Each dock must then be programmed with the same PIN and set to check for the code in the instruments.

1. Verify that the ToxiPro and ToxiLtd instruments have firmware version 6.3 or higher. Instrument firmware version is shown in the start up screens for the instrument.

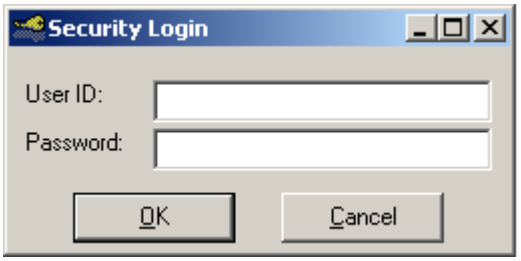
   If needed, new ToxiPro Firmware can be downloaded at no charge from Sperian Instrumentation's download website at http://www.biodownloads.com. The ToxiLtd will need to be returned to Sperian Instrumentation for firmware updates.

2. Verify that the IQ Express Dock contains firmware version 4.23 or higher. New dock firmware can also be downloaded at no charge from Sperian Instrumentation's download website at http://www.biodownloads.com.

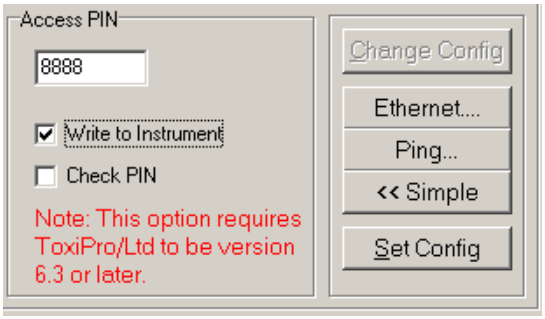
3. Select the dock that will be used to write the PIN (Personal Identification Number) to the instrument. Connect the dock to the PC either by USB port or by Ethernet port. If using an Ethernet connection, the Ethernet setting must be configured to "Live". If more than one dock will be used to update the instruments, perform steps 4-10 for each dock.

4. Open the IQ Express software.

5. Click "Advanced" in the row of buttons on the lower right. The software will automatically show the Security Login screen and prompt you for your user name and password. If the "Advanced" button is not shown, click on "Change Config" first to access it.

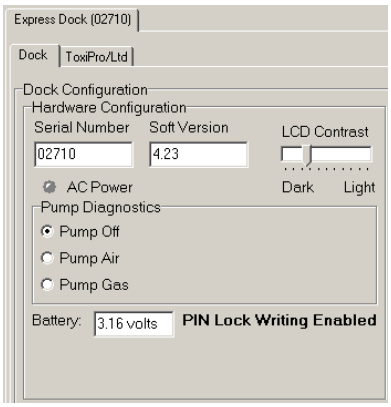


6. Enter a valid User ID and Password. The Access PIN settings will be shown:

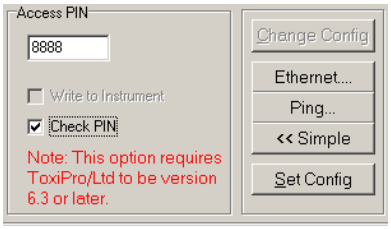


7. Enter a unique 4-digit PIN in the input box under Access PIN and click on "Write to Instrument".

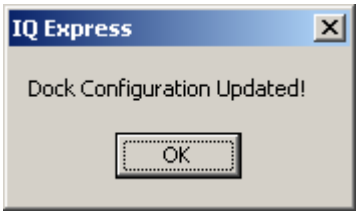
8. Click "Set Config" to tell the dock to upload the PIN setting to the instruments. The software will automatically show the Security Login screen a second time and prompt you for your user name and password. Once a valid User ID and Password have been entered, "PIN Lock Writing Enabled" will be shown in the dock configuration window. The dock is now ready to upload the PIN to the instruments.



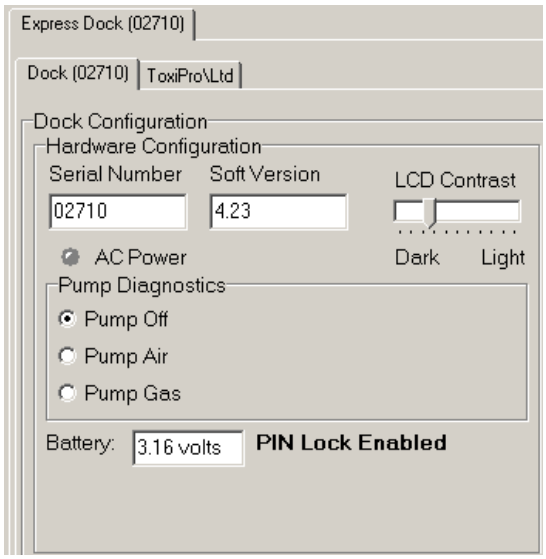
9. Place the instrument(s) that is/are to be configured with the PIN in the dock while PIN Lock Writing is enabled.
10. Once the PIN has been uploaded to all of the instruments, access the dock's advanced settings again and click on "Check PIN". Then click the "Set Config" button.



Enter your User ID and password again when the Security Login window is shown. A window will be shown to indicate that the dock configuration has been updated.



11. Click OK. "PIN Lock Enabled" will then be shown in the PC software in the dock configuration window.



The dock will now verify the PIN in any instrument that interfaces with it.

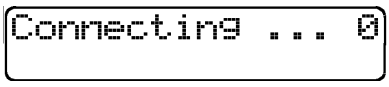
12. For every other dock in the system, access the dock's advanced settings, enter the PIN, click on "Check PIN" and click the "Set Config" button.

With PIN lock enabled, only instruments with a PIN matching the dock's PIN will be processed.

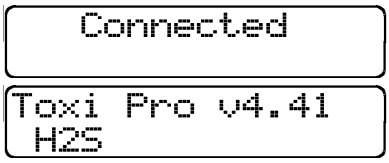
4. Dock Use

Once the IQ Express is connected to the gas cylinder(s) and has been properly configured, insert the detector into the port on the IQ Express.

Once the IQ Express recognizes the instrument, it will show the following screens as the detector's status is assessed.



Once the connection is made, the IQ Express will display "Connected", followed by the instrument type and software version.



Note: Instrument firmware version 4.3 or greater is required for interface with the IQ Express. Attempts to use the IQ Express with Toxi/OxyPro/Ltd instruments with firmware versions lower than 4.3 will result in system errors.

If the connection can not be completed, the IQ Express Dock will show a series of screens detailing the failure. When "Fail, Try Again" is shown, remove the

instrument from the dock, wait for it to reset and then reinsert it into the dock.

4.1 Test Sequence

Once the instrument has been recognized, the zero calibration will begin.

⚠WARNING Performing the fresh air calibration in a contaminated atmosphere will lead to inaccurate and potentially dangerous readings. The IQ Express must be located in a fresh air environment containing 20.9% oxygen and no toxic gases during calibration. If fresh air is unavailable, a cylinder of "zero air" containing 20.9% oxygen and 0 PPM toxic gases must be connected to the fresh air port with a demand flow regulator and a piece of tubing whenever an instrument is in the IQ Express Dock.

Once the zero calibration is complete, the IQ Express will flow gas to the instrument in order to perform the "bump" test (toxic sensor units only). If the instrument is due for calibration, the IQ Express Dock will bypass the bump test and proceed directly to the span calibration (toxic sensor instruments only).

Once the instrument responds to the gas, the IQ Express will analyze the response to determine if the instrument passes the bump test.

The gas detector will pass the bump test if the sensor response to the gas is within 10% if the reading is lower than the expected sensor output or within 20% if the reading is higher than the expected sensor output. If the bump test is passed, the IQ Express will proceed to the alarm tests.

If the instrument fails the bump test or if the instrument's calibration due date has passed, the IQ Express will automatically bypass the bump test and proceed to a full instrument calibration without further input from the user.

Following successful bump test or calibration, the IQ Express will test the instrument's alarm systems.

If all alarms are operational, the following screen will be shown.

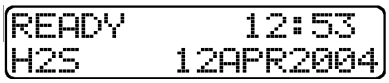
See section 4.3 for further details on assessing test failures.

If all tests have been passed, the following screen will be shown.

Remove the detector from the IQ Express. The detector is now fit for use.

⚠WARNING Do not reinsert the ToxiPro or ToxiLtd back into an IQ Express Dock for at least 5 minutes after it has been removed. Immediate reinsertion of the ToxiPro or ToxiLtd into an IQ Express Dock may lead to inaccurate and potentially dangerous readings.

Once the detector is removed from the dock, the IQ Express will reset itself and prepare itself for the next instrument. In approximately 10 seconds the display will show READY with the time, date and sensor type. The IQ Express is now ready for the next detector.



If the same instrument is placed in the IQ Express Dock immediately following its removal from the dock, the dock will show "ZERO Stabilizing" with a count down as it prepares to retest the instrument.

4.2 Loss of IrDA Connection

In the event of a loss of communication between the dock and the instrument, the LCD will first indicated that the IrDA is not responding.

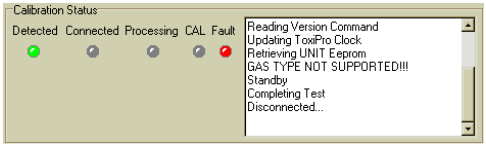
If the PC fails to reestablish the connection, the LCD will indicate “Connection Lost”.

Remove the instrument from the dock. The IQ Express should reset itself in approximately 10 seconds.

“IrDA Busy” may also be shown.

4.3 Test Failures

Failures can occur for a number of reasons. When a fault occurs, the reason for the failure will be shown on the IQ Express Dock’s LCD. If the Express Software is running and the dock is properly connected to the PC, the fault will also be indicated in the output box on the instrument tab in the IQ Express software.



4.3.1 No gas detected

If the detector fails to respond to the calibration gas, the message “NO GAS DETECTED” will be shown.

4.3.2 Span calibration failure

If the IQ Express is unable to complete the a span calibration, the IQ Express will show the failure on the LCD. The failure will also be shown in the output box on the instrument page in the PC software.

4.3.3 Wrong Gas Type

As discussed above, the IQ Express must be configured for both the type and the amount of calibration gas that will be used during calibration. In the event that a detector is placed in the dock that is incompatible with the IQ Express Dock’s calibration gas setting, the dock will display “WRONG GAS TYPE” and the interface will be stopped.

The output box in the software will indicate that the gas type is not supported, the fault indicator will be lit and the test will not be performed.

Remove the instrument from the IQ Express. Note that calibration has not taken place.

To change the IQ Express’s calibration gas settings, see section 3.2.1 above.

4.3.4 Alarm test failure

If the IQ Express fails to recognize an alarm that should be present, it will indicate it on the display screen following the alarm test.

The failure will also be indicated in the software in the instrument information.

4.3.5 PC Aborted Test

If the PC is unable to complete the tests for any reason, the following screen will be shown:

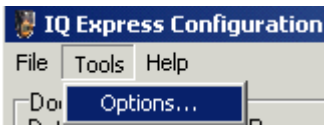
This message may be shown for a variety of reasons. See the Calibration Status output box for further details.

5. Tools

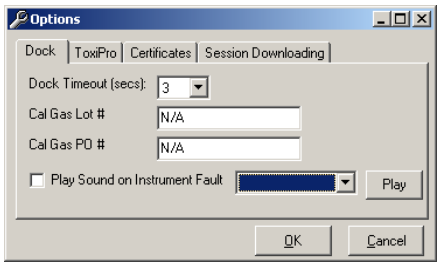
The Tools menu contains options for the IQ Express including the following:

- Dock Timeout Setting
- Calibration Gas Lot and Purchase Order (P.O.) Number Entry (for tracking purposes)
- Audible warning settings
- Instrument Settings for the detector including the Timeout Setting and the Calibration Due Reminder Setting
- Settings for Printing Calibration and Bump Test Certificates.
- Session downloading file location setting.

Click on Tools / Options to access the settings.

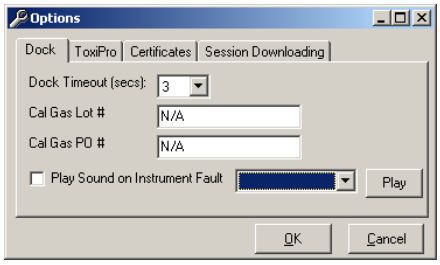


The Options screen will then be shown.



5.1 Dock

The Dock Tab under Tools / Options includes settings for the Dock Timeout and, Calibration Gas Lot and P.O. Numbers and the option to play a sound on instrument fault.



The Dock Timeout Setting controls the amount of time that needs to pass after connection between the dock and the PC is lost before the system will notify you that the connection has been lost. Options are given in whole numbers between 1 and 10 seconds. To change the setting, click on the arrow to the right of the timeout setting to access the list and select the new setting.

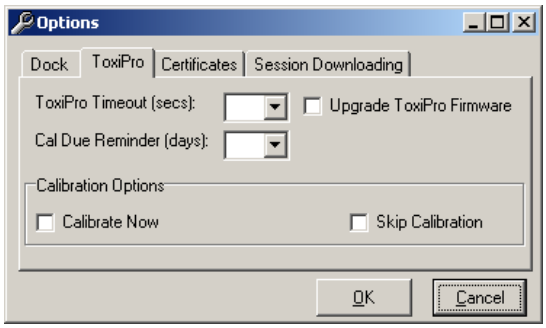
The Calibration Gas Lot and P.O. Numbers are shown as input boxes that accept information. The lot and P.O. numbers listed are shown on any calibration certificates that are printed.

The IQ Express is programmed with numerous sounds that can be played by the PC to indicate an instrument fault. To select a sound, check the box next to “Play sound on Instrument Fault” and then select from eight available sound options by using the drop down box to the right.

See section 5.3 for details on calibration certificates.

5.2 ToxiPro

The ToxiPro tab contains settings for the ToxiPro including the Timeout setting, the Calibration Due Reminder setting, the option to automatically update ToxiPro Firmware and calibration options.



The Timeout setting controls the amount of time that needs to pass after connection between the dock and the PC is lost before the instrument will reset itself. Options are in 5-second increments from 5 to 30 seconds. To change the setting, click on the arrow to the right of the timeout setting to access the list and select the new setting.

The Calibration Due Reminder setting controls the amount of time that needs to pass without a successful calibration before the ToxiPro will remind you that calibration is due. The reminder can be set to any whole number between 1 and 180 days. To disable the calibration due reminder, change the setting to “0”. To change the setting, click on the arrow to the right of the timeout setting to access the list and select the new setting.

The checkbox to the left of “Upgrade ToxiPro Firmware” controls automatic ToxiPro Firmware updates by the IQ Express Dock whenever a ToxiPro is placed in the dock. Click on the box to enable the automatic updates.

The ToxiPro firmware must be downloaded and stored in the appropriate folder for the updates to take place. The folder location is on your local hard drive under Program Files.

New firmware files for ToxiPro instruments equipped with CO, CO+, CO-H, H_2S, SO_2, NH_3, PH_3 and HCN sensors must be stored in: C:\ Program Files \ Biosystems \ Flash Upload Utilities \ ToxiPro \ A.

New firmware files for ToxiPro instruments equipped with O_2, Cl_2, NO_2 and ClO_2 sensors must be stored in: C:\ Program Files \ Biosystems \ Flash Upload Utilities \ ToxiPro \ B.

Two calibration options are listed near the bottom of the window.

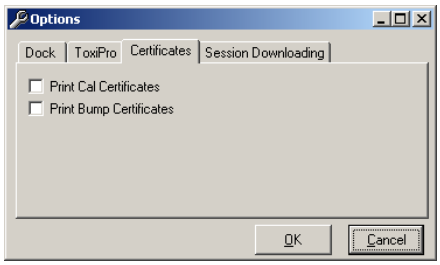
Select “Calibrate Now” to automatically perform a full calibration whenever an instrument is placed in the dock.

Select “Skip Calibration” to automatically skip the calibration of any instrument that is placed in the dock.

For further details on Sperian Instrumentation’s calibration requirements, see Appendix B.

5.3 Certificates

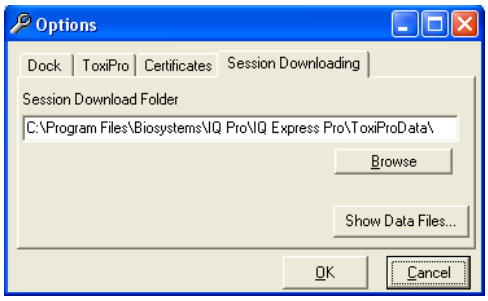
The Certificates tab provides controls for the automatic printing of Calibration and Bump Test Certificates.



Click on the check box next to the option to select it. Note that a great deal of paperwork could be generated if “Print Bump Certificates” is selected and a large number of instruments are bump-tested daily though the IQ Express Dock.

5.4 Session Downloading

The session downloading tab contains the file location for session downloads.

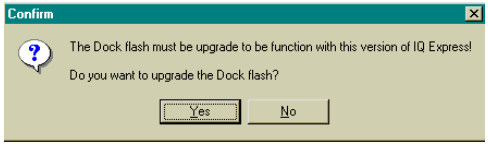


To change the destination directory for the downloaded files, either type the address in directly or use the “Browse” button to locate the new folder.

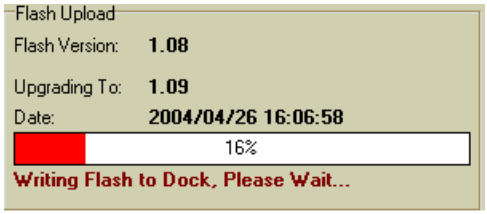
To view stored data files in the download folder, click on the “Show Data Files” button. Once the data files are shown, if BioTrak version 7.40 or later is installed, clicking on one of the stored files will automatically launch BioTrak.

6. Software Revisions

Sperian Instrumentation will release new versions of IQ Express software from time to time. To install the new version, simply place the disk in your PC’s CD-tray. The upload will start automatically. You will be prompted to confirm the update.


Confirm
The Dock flash must be upgrade to be function with this version of IQ Express!
Do you want to upgrade the Dock flash?
Yes
No

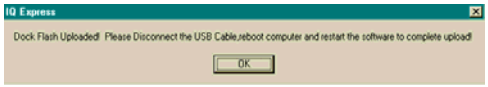
Click Yes. The status of the upload is shown at the far right of the screen in the dock’s information page.



The dock will also indicate that the Flash is being uploaded.

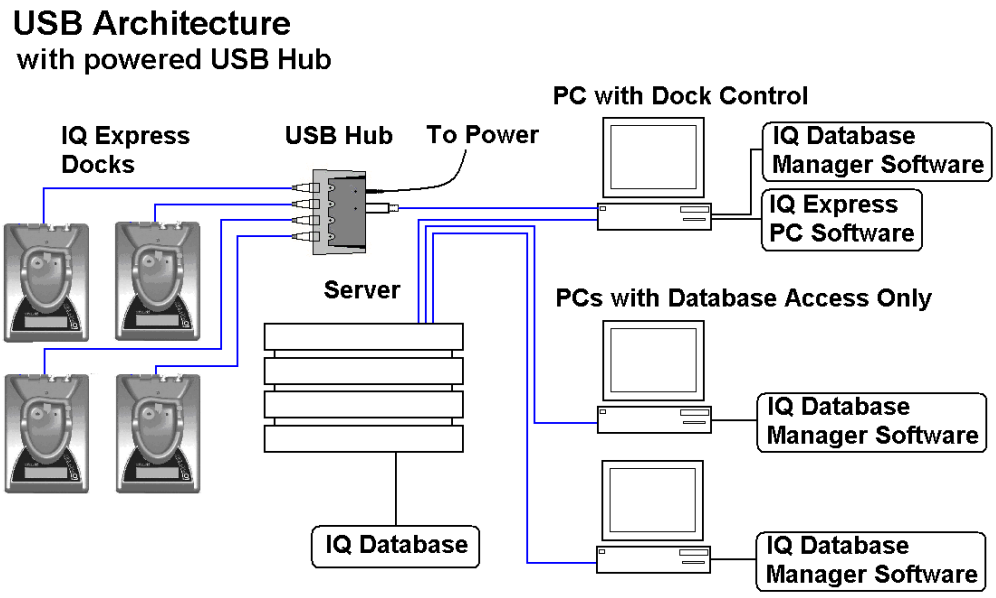
CAUTION Do not unplug the IQ Express Dock or interfere with the flash upload in anyway. Interfering with the flash upload may result in damage to the IQ Express Dock.

Once the upload is completed, you’ll need to restart the PC for the new settings to take effect.


IQ Express
Dock Flash Uploaded! Please Disconnect the USB Cable,reboot computer and restart the software to complete upload!
OK

Disconnect the PC from the IQ Express Dock and click OK. Then restart the PC.

Appendix A: USB Architecture with Network Access



Appendix B: Calibration Frequency

One of the most common questions that we are asked at Sperian Instrumentation is: ***"How often should I calibrate my gas detector?"***

Sensor Reliability and Accuracy

Today's sensors are designed to provide years of reliable service. In fact, many sensors are designed so that with normal use they will only lose 5% of their sensitivity per year or 10% over a two-year period. Given this, it should be possible to use a sensor for up to two full years without significant loss of sensitivity.

Verification of Accuracy

With so many reasons why a sensor can lose sensitivity and given the fact that dependable sensors can be key to survival in a hazardous environment, frequent verification of sensor performance is paramount.

There is only one sure way to verify that a sensor can respond to the gas for which it is designed. That is to expose it to a known concentration of target gas and compare the reading with the concentration of the gas. This is referred to as a "bump" test. This test is very simple and takes only a few seconds to accomplish. **The safest course of action is to do a "bump" test prior to each day's use**. It is not necessary to make a calibration adjustment if the readings fall between 90%* and 120% of the expected value. As an example, if a CO sensor is checked using a gas concentration of 50 PPM it is not necessary to perform a calibration unless the readings are either below 45 PPM or above 60 PPM.

***The Canadian Standards Association (CSA) requires combustible gas sensors to undergo calibration when the displayed value during a bump test fails to fall between 100% and 120% of the expected value for the gas.**

Lengthening the Intervals between Verification of Accuracy

We are often asked whether there are any circumstances in which the period between accuracy checks may be lengthened.

Sperian Instrumentation is not the only manufacturer to be asked this question! One of the professional organizations to which Sperian Instrumentation belongs is the Industrial Safety Equipment Association (ISEA). The "Instrument Products" group of this organization has been very active in developing a protocol to clarify the minimum conditions under which the interval between accuracy checks may be lengthened.

A number of leading gas detection equipment manufacturers have participated in the development of the ISEA guidelines concerning calibration frequency. Sperian Instrumentation's procedures closely follow these guidelines.

If your operating procedures do not permit daily checking of the sensors, Sperian Instrumentation recommends the following procedure to establish a safe and prudent accuracy check schedule for your Sperian instruments:

1. During a period of initial use of at least 10 days in the intended atmosphere, check the sensor response daily to be sure there is nothing in the atmosphere that is poisoning the sensor(s). The period of initial use must be of sufficient duration to ensure that the sensors are exposed to all conditions that might have an adverse effect on the sensors.
2. If these tests demonstrate that it is not necessary to make adjustments, the time between checks may be lengthened. The interval between accuracy checking should not exceed 30 days.
3. When the interval has been extended the toxic and combustible gas sensors should be replaced immediately upon warranty expiration. This will minimize the risk of failure during the interval between sensor checks.
4. The history of the instrument response between verifications should be kept. Any conditions, incidents, experiences, or exposure to contaminants that might have an adverse effect on the calibration state of the sensors should trigger immediate re-verification of accuracy before further use.
5. Any changes in the environment in which the instrument is being used, or changes in the work that is being performed, should trigger a resumption of daily checking.
6. If there is any doubt at any time as to the accuracy of the sensors, verify the accuracy of the sensors by exposing them to known concentration test gas before further use.

Gas detectors used for the detection of oxygen deficiencies, flammable gases and vapors, or toxic contaminants must be maintained and operated properly to do the job they were designed to do. Always follow the guidelines provided by the manufacturer for any gas detection equipment you use!

If there is any doubt regarding your gas detector's accuracy, do an accuracy check! All it takes is a few moments to verify whether or not your instruments are safe to use.

One Button Auto Calibration

While it is only necessary to do a "bump" test to ensure that the sensors are working properly, all current Sperian gas detectors offer a one-button auto calibration feature. This feature allows you to calibrate a Sperian gas detector in about the same time as it takes to complete a "bump" test. The use of automatic bump test and calibration stations can further simplify the tasks, while automatically maintaining records.

Don't take a chance with your life. Verify accuracy frequently!

Please read also Sperian Instrumentation's application note: *AN20010808 "Use of 'equivalent' calibration gas mixtures"*. This application note provides procedures to ensure safe calibration of LEL sensors that are subject to silicone poisoning.

Sperian Instrumentation's website is located at

http://www.sperian.com

Sperian Instrumentation Warranty Gas Detection Products

General

Sperian Protection Instrumentation, LLC (hereafter Sperian) warrants gas detectors, sensors and accessories manufactured and sold by Sperian, to be free from defects in materials and workmanship for the periods listed in the tables below.

Damages to any Sperian products that result from abuse, alteration, power fluctuations including surges and lightning strikes, incorrect voltage settings, incorrect batteries, or repair procedures not made in accordance with the Instrument's Reference Manual are not covered by the Sperian warranty.

The obligation of Sperian under this warranty is limited to the repair or replacement of components deemed by the Sperian Instrument Service Department to have been defective under the scope of this standard warranty. To receive consideration for warranty repair or replacement procedures, products must be returned with transportation and shipping charges prepaid to Sperian at its manufacturing location in Middletown, Connecticut, or to a Sperian Authorized Warranty Service Center. It is necessary to obtain a return authorization number from Sperian prior to shipment.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. SPERIAN WILL NOT BE LIABLE FOR LOSS OR DAMAGE OF ANY KIND CONNECTED TO THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCTS TO FUNCTION OR OPERATE PROPERLY.

Instrument & Accessory Warranty Periods

Product(s)	Warranty Period
PHD6™, Cannonball*3*™, Multi Vision™, Toxi Vision™	As long as the instrument is in service
ToxiPro®, MultiPro™	2 years from date of purchase
ToxiLtd®	2 years after activation or 2 years after the "Must Be Activated By" date, whichever comes first
Travelpanel™, ZoneGuard™	One year from the date of purchase
Battery packs and chargers, sampling pumps and other components, which by their design are consumed or depleted during normal operation, or which may require periodic replacement	One year from the date of purchase

Sensor Warranty Periods

Instrument(s)	Sensor Type(s)	Warranty Period
PHD6™, Cannonball*3*™, Multi Vision™, MultiPro™, Toxi Vision™, ToxiPro®	O_2, LEL**, CO, CO+, H_2S & Duo-Tox	2 Years
	All Other Sensors	1 Year
All Others	All Sensors	1 Year

**** Damage to combustible gas sensors by acute or chronic exposure to known sensor poisons such as volatile lead (aviation gasoline additive), hydride gases such as phosphine, and volatile silicone gases emitted from silicone caulks/sealants, silicone rubber molded products, laboratory glassware greases, spray lubricants, heat transfer fluids, waxes & polishing compounds (neat or spray aerosols), mold release agents for plastics injection molding operations, waterproofing formulations, vinyl & leather preservatives, and hand lotions which may contain ingredients listed as cyclomethicone, dimethicone and polymethicone (at the discretion of Sperian's Instrument Service department) void Sperian Instrumentation's Standard Warranty as it applies to the replacement of combustible gas sensors.**